



wwPDB X-ray Structure Validation Summary Report ⓘ

Apr 22, 2025 – 12:06 AM EDT

PDB ID : 8TOV / pdb_00008tov
Title : HIV-CA Disulfide linked Hexamer bound to Quinazolin-4-one Scaffold inhibitor
Authors : Goldstone, D.C.; Barnett, M.J.; Taka, J.R.H.
Deposited on : 2023-08-04
Resolution : 2.70 Å(reported)

This is a wwPDB X-ray Structure Validation Summary Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 2022.3.0, CSD as543be (2022)
Xtriage (Phenix) : 2.0rc1
EDS : 3.0
buster-report : 1.1.7 (2018)
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4 : 9.0.006 (Gargrove)
Density-Fitness : 1.0.12
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.42

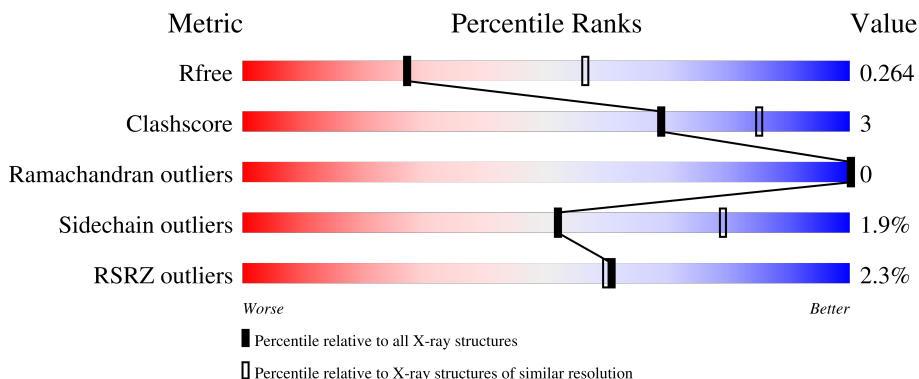
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

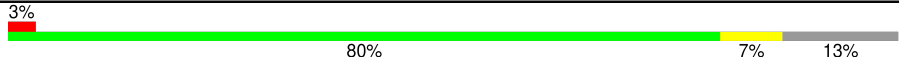
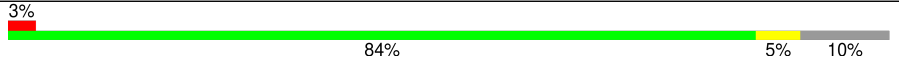

The reported resolution of this entry is 2.70 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	3333 (2.70-2.70)
Clashscore	180529	3684 (2.70-2.70)
Ramachandran outliers	177936	3633 (2.70-2.70)
Sidechain outliers	177891	3633 (2.70-2.70)
RSRZ outliers	164620	3333 (2.70-2.70)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	231	
1	B	231	
1	C	231	
1	D	231	
1	E	231	

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Mol	Chain	Length	Quality of chain
1	F	231	<div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div>2%81%7%13%</div></div>
1	G	231	<div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div>2%79%8%13%</div></div>
1	H	231	<div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div>2%78%7%14%</div></div>
1	I	231	<div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div>%80%6%13%</div></div>
1	J	231	<div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div>%82%6%12%</div></div>
1	K	231	<div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div>2%79%7%13%</div></div>
1	L	231	<div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div><div>2%77%9%14%</div></div>

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 19609 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Matrix protein p17.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	G	202	Total	C	N	O	S	0	0	0
			1542	982	255	292	13			
1	I	200	Total	C	N	O	S	0	1	0
			1531	974	258	285	14			
1	J	204	Total	C	N	O	S	0	1	0
			1558	990	264	290	14			
1	K	202	Total	C	N	O	S	0	1	0
			1561	992	265	290	14			
1	L	199	Total	C	N	O	S	0	1	0
			1525	972	255	284	14			
1	H	199	Total	C	N	O	S	0	0	0
			1530	974	256	286	14			
1	A	202	Total	C	N	O	S	0	0	0
			1545	979	259	295	12			
1	B	207	Total	C	N	O	S	0	1	0
			1576	1001	260	302	13			
1	C	203	Total	C	N	O	S	0	1	0
			1560	988	261	297	14			
1	D	206	Total	C	N	O	S	0	1	0
			1581	1002	263	302	14			
1	E	202	Total	C	N	O	S	0	1	0
			1554	986	258	297	13			
1	F	202	Total	C	N	O	S	0	0	0
			1551	983	258	297	13			

There are 48 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
G	14	CYS	ALA	engineered mutation	UNP D2ECE2
G	45	CYS	GLU	engineered mutation	UNP D2ECE2
G	184	ALA	TRP	engineered mutation	UNP D2ECE2
G	185	ALA	MET	engineered mutation	UNP D2ECE2
I	14	CYS	ALA	engineered mutation	UNP D2ECE2

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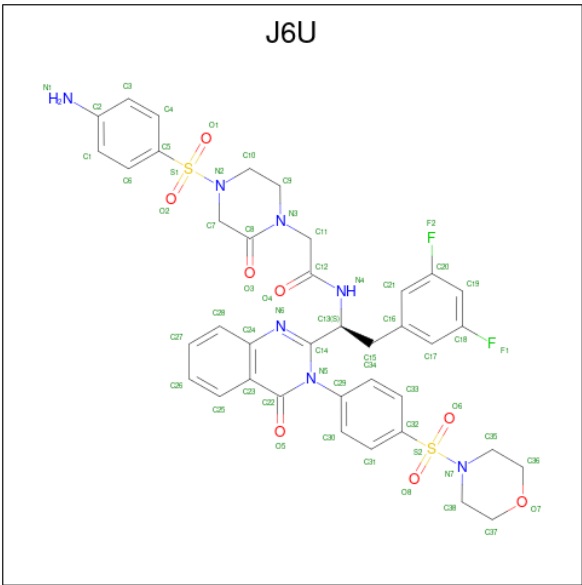
Chain	Residue	Modelled	Actual	Comment	Reference
I	45	CYS	GLU	engineered mutation	UNP D2ECE2
I	184	ALA	TRP	engineered mutation	UNP D2ECE2
I	185	ALA	MET	engineered mutation	UNP D2ECE2
J	14	CYS	ALA	engineered mutation	UNP D2ECE2
J	45	CYS	GLU	engineered mutation	UNP D2ECE2
J	184	ALA	TRP	engineered mutation	UNP D2ECE2
J	185	ALA	MET	engineered mutation	UNP D2ECE2
K	14	CYS	ALA	engineered mutation	UNP D2ECE2
K	45	CYS	GLU	engineered mutation	UNP D2ECE2
K	184	ALA	TRP	engineered mutation	UNP D2ECE2
K	185	ALA	MET	engineered mutation	UNP D2ECE2
L	14	CYS	ALA	engineered mutation	UNP D2ECE2
L	45	CYS	GLU	engineered mutation	UNP D2ECE2
L	184	ALA	TRP	engineered mutation	UNP D2ECE2
L	185	ALA	MET	engineered mutation	UNP D2ECE2
H	14	CYS	ALA	engineered mutation	UNP D2ECE2
H	45	CYS	GLU	engineered mutation	UNP D2ECE2
H	184	ALA	TRP	engineered mutation	UNP D2ECE2
H	185	ALA	MET	engineered mutation	UNP D2ECE2
A	14	CYS	ALA	engineered mutation	UNP D2ECE2
A	45	CYS	GLU	engineered mutation	UNP D2ECE2
A	184	ALA	TRP	engineered mutation	UNP D2ECE2
A	185	ALA	MET	engineered mutation	UNP D2ECE2
B	14	CYS	ALA	engineered mutation	UNP D2ECE2
B	45	CYS	GLU	engineered mutation	UNP D2ECE2
B	184	ALA	TRP	engineered mutation	UNP D2ECE2
B	185	ALA	MET	engineered mutation	UNP D2ECE2
C	14	CYS	ALA	engineered mutation	UNP D2ECE2
C	45	CYS	GLU	engineered mutation	UNP D2ECE2
C	184	ALA	TRP	engineered mutation	UNP D2ECE2
C	185	ALA	MET	engineered mutation	UNP D2ECE2
D	14	CYS	ALA	engineered mutation	UNP D2ECE2
D	45	CYS	GLU	engineered mutation	UNP D2ECE2
D	184	ALA	TRP	engineered mutation	UNP D2ECE2
D	185	ALA	MET	engineered mutation	UNP D2ECE2
E	14	CYS	ALA	engineered mutation	UNP D2ECE2
E	45	CYS	GLU	engineered mutation	UNP D2ECE2
E	184	ALA	TRP	engineered mutation	UNP D2ECE2
E	185	ALA	MET	engineered mutation	UNP D2ECE2
F	14	CYS	ALA	engineered mutation	UNP D2ECE2
F	45	CYS	GLU	engineered mutation	UNP D2ECE2
F	184	ALA	TRP	engineered mutation	UNP D2ECE2

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Chain	Residue	Modelled	Actual	Comment	Reference
F	185	ALA	MET	engineered mutation	UNP D2ECE2

- Molecule 2 is 2-[4-(4-aminobenzene-1-sulfonyl)-2-oxopiperazin-1-yl]-N-[(1R)-2-(3,5-difluorophenyl)-1-{3-[4-(morpholine-4-sulfonyl)phenyl]-4-oxo-3,4-dihydroquinazolin-2-yl}ethyl]acetamide (CCD ID: J6U) (formula: C₃₈H₃₇F₂N₇O₈S₂) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
2	G	1	Total	C	F	N	O	S	0	0
			57	38	2	7	8	2		
2	I	1	Total	C	F	N	O	S	0	0
			57	38	2	7	8	2		
2	J	1	Total	C	F	N	O	S	0	0
			57	38	2	7	8	2		
2	K	1	Total	C	F	N	O	S	0	0
			57	38	2	7	8	2		
2	L	1	Total	C	F	N	O	S	0	0
			57	38	2	7	8	2		
2	H	1	Total	C	F	N	O	S	0	0
			57	38	2	7	8	2		
2	A	1	Total	C	F	N	O	S	0	0
			57	38	2	7	8	2		
2	B	1	Total	C	F	N	O	S	0	0
			57	38	2	7	8	2		
2	C	1	Total	C	F	N	O	S	0	0
			57	38	2	7	8	2		

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	D	1	Total	C	F	N	O	S	
			57	38	2	7	8	2	
2	E	1	Total	C	F	N	O	S	
			57	38	2	7	8	2	
2	F	1	Total	C	F	N	O	S	
			57	38	2	7	8	2	

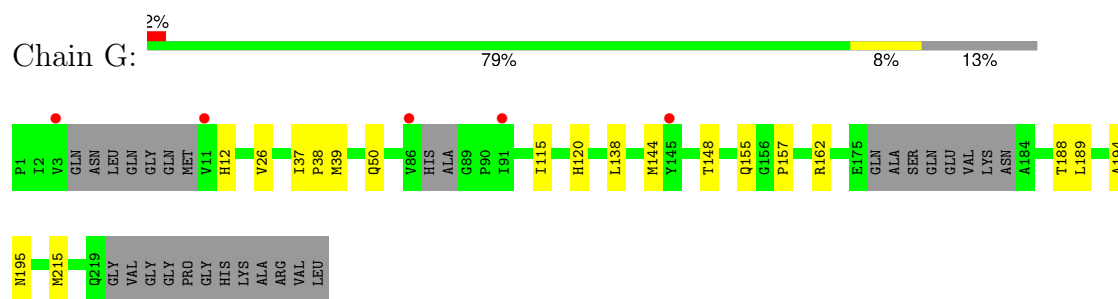
- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	G	35	Total	O		
			35	35	0	0
3	I	22	Total	O		
			22	22	0	0
3	J	24	Total	O		
			24	24	0	0
3	K	29	Total	O		
			29	29	0	0
3	L	35	Total	O		
			35	35	0	0
3	H	37	Total	O		
			37	37	0	0
3	A	25	Total	O		
			25	25	0	0
3	B	30	Total	O		
			30	30	0	0
3	C	17	Total	O		
			17	17	0	0
3	D	20	Total	O		
			20	20	0	0
3	E	16	Total	O		
			16	16	0	0
3	F	21	Total	O		
			21	21	0	0

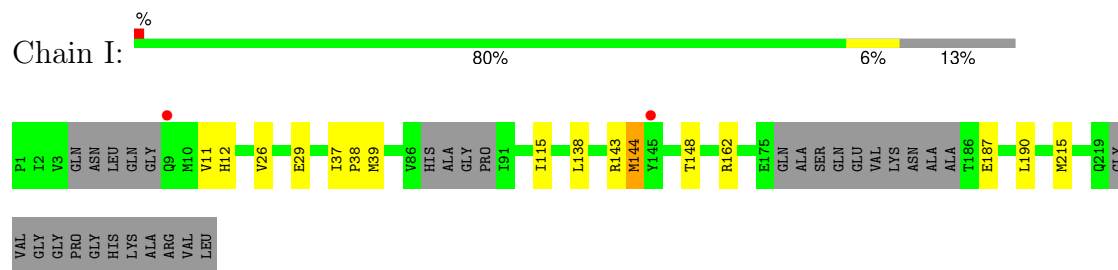
3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density ($RSRZ > 2$). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

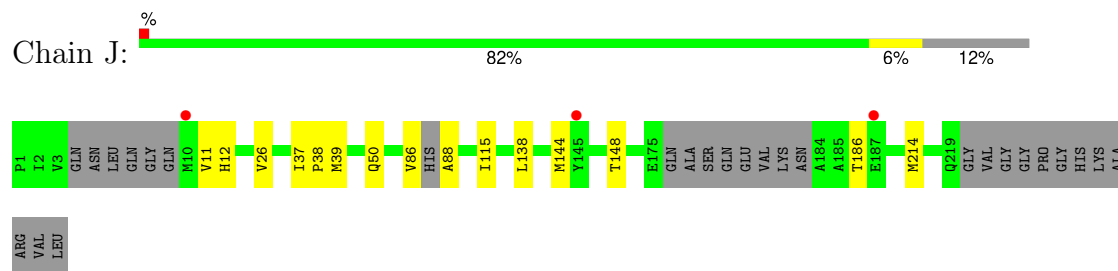
• Molecule 1: Matrix protein p17



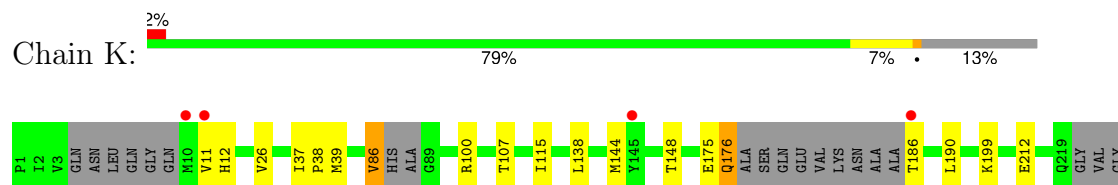
• Molecule 1: Matrix protein p17



• Molecule 1: Matrix protein p17




• Molecule 1: Matrix protein p17



GLY
PRO
GLY
HIS
LYS
ALA
ARG
VAL
LEU


• Molecule 1: Matrix protein p17

Chain L: 



K199
M215
Q219
GLY
VAL
GLY
PRO
HIS
LYS
ALA
ARG
VAL
LEU


• Molecule 1: Matrix protein p17

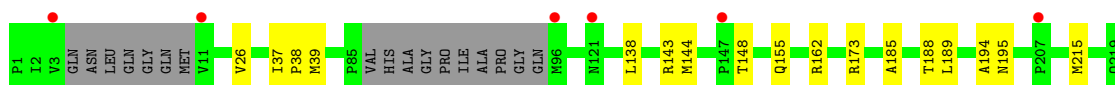
Chain H: 



VAL
GLY
GLY
PRO
HIS
LYS
ALA
ARG
VAL
LEU


• Molecule 1: Matrix protein p17

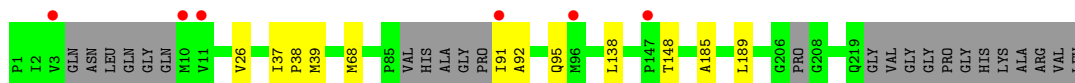
Chain A: 




GLY
VAL
GLY
GLY
PRO
HIS
LYS
ALA
ARG
VAL
LEU

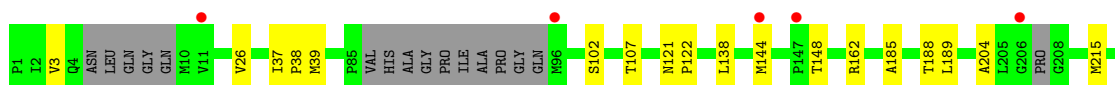
• Molecule 1: Matrix protein p17

Chain B: 



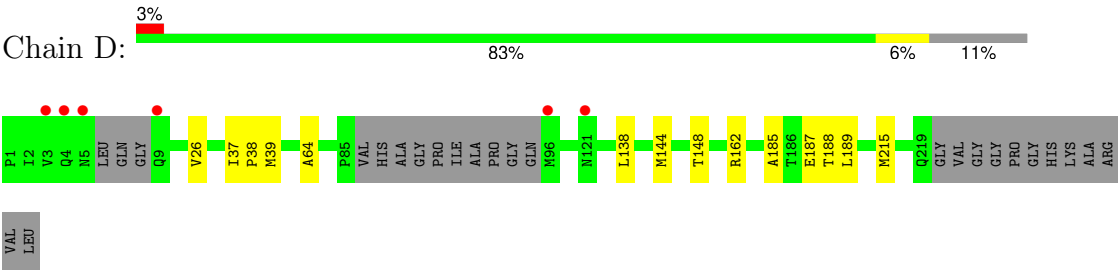
• Molecule 1: Matrix protein p17

Chain C: 

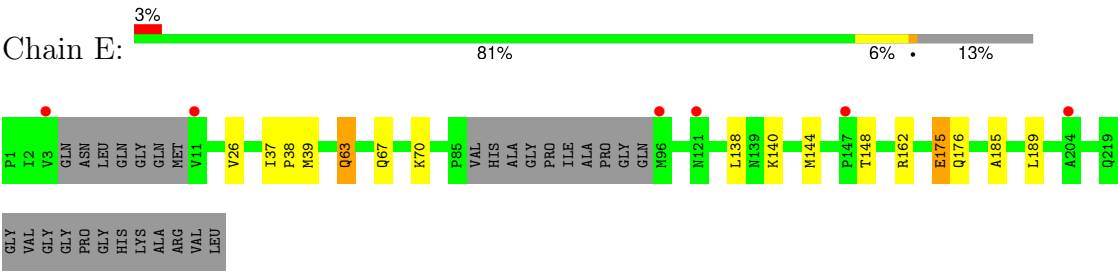


Q219
GLY
VAL
GLY
GLY
PRO
HIS
LYS
ALA
ARG
VAL
LEU

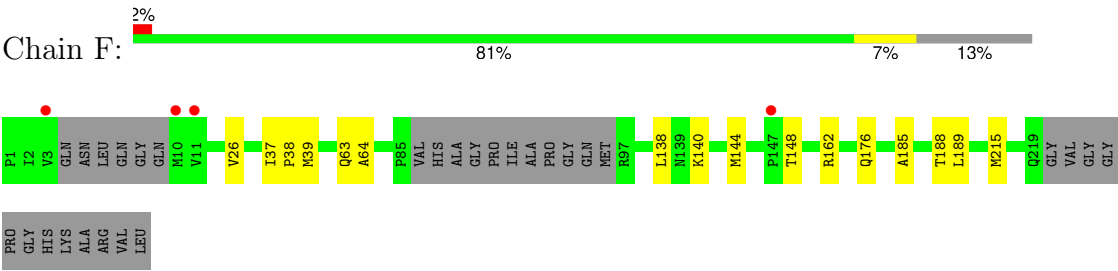
● Molecule 1: Matrix protein p17



● Molecule 1: Matrix protein p17



● Molecule 1: Matrix protein p17



4 Data and refinement statistics

Property	Value	Source
Space group	P 1	Depositor
Cell constants a, b, c, α , β , γ	91.17Å 91.33Å 117.52Å 78.82° 87.20° 60.12°	Depositor
Resolution (Å)	15.97 – 2.70 15.97 – 2.70	Depositor EDS
% Data completeness (in resolution range)	98.8 (15.97-2.70) 98.8 (15.97-2.70)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.32 (at 2.69Å)	Xtriage
Refinement program	REFMAC 5.8.0419	Depositor
R, R_{free}	0.220 , 0.260 0.223 , 0.264	Depositor DCC
R_{free} test set	4220 reflections (4.80%)	wwPDB-VP
Wilson B-factor (Å ²)	39.3	Xtriage
Anisotropy	0.107	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 35.7	EDS
L-test for twinning ²	$\langle L \rangle = 0.52$, $\langle L^2 \rangle = 0.36$	Xtriage
Estimated twinning fraction	0.000 for h,h-k,-l	Xtriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	19609	wwPDB-VP
Average B, all atoms (Å ²)	45.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.08% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality

5.1 Standard geometry

Bond lengths and bond angles in the following residue types are not validated in this section: J6U

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	$\# Z > 5$	RMSZ	$\# Z > 5$
1	A	0.44	0/1577	0.67	0/2146
1	B	0.44	0/1610	0.66	0/2189
1	C	0.43	0/1593	0.67	0/2163
1	D	0.43	0/1616	0.68	0/2197
1	E	0.42	0/1589	0.66	0/2161
1	F	0.43	0/1583	0.68	0/2153
1	G	0.45	0/1575	0.68	0/2143
1	H	0.47	0/1563	0.70	0/2124
1	I	0.44	0/1570	0.68	0/2133
1	J	0.44	0/1594	0.68	0/2168
1	K	0.46	0/1601	0.69	0/2174
1	L	0.44	0/1561	0.69	0/2123
All	All	0.44	0/19032	0.68	0/25874

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1
1	C	0	2
1	D	0	1
1	F	0	1
All	All	0	5

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (5) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	188	THR	Mainchain
1	C	188	THR	Mainchain
1	C	3	VAL	Mainchain
1	D	188	THR	Peptide
1	F	188	THR	Mainchain

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1545	0	1517	10	0
1	B	1576	0	1544	6	0
1	C	1560	0	1535	12	0
1	D	1581	0	1552	7	0
1	E	1554	0	1531	12	0
1	F	1551	0	1527	10	0
1	G	1542	0	1523	13	0
1	H	1530	0	1521	11	0
1	I	1531	0	1504	12	0
1	J	1558	0	1550	10	0
1	K	1561	0	1551	15	0
1	L	1525	0	1512	12	0
2	A	57	0	0	0	0
2	B	57	0	0	0	0
2	C	57	0	0	2	0
2	D	57	0	0	0	0
2	E	57	0	0	0	0
2	F	57	0	0	0	0
2	G	57	0	0	0	0
2	H	57	0	0	0	0
2	I	57	0	0	0	0
2	J	57	0	0	0	0
2	K	57	0	0	1	0
2	L	57	0	0	0	0
3	A	25	0	0	3	0
3	B	30	0	0	0	0
3	C	17	0	0	2	0
3	D	20	0	0	1	0
3	E	16	0	0	2	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	F	21	0	0	0	0
3	G	35	0	0	3	0
3	H	37	0	0	2	0
3	I	22	0	0	3	0
3	J	24	0	0	1	0
3	K	29	0	0	1	0
3	L	35	0	0	2	0
All	All	19609	0	18367	129	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 3.

The worst 5 of 129 close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:J:186:THR:CG2	1:J:214:MET:SD	2.76	0.74
1:J:186:THR:HG23	1:J:214:MET:SD	2.28	0.73
1:F:26:VAL:HG21	1:F:39:MET:HG2	1.70	0.73
1:E:26:VAL:HG21	1:E:39:MET:HG2	1.71	0.72
1:J:26:VAL:HG21	1:J:39:MET:HG2	1.71	0.71

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	196/231 (85%)	195 (100%)	1 (0%)	0	100	100
1	B	200/231 (87%)	199 (100%)	1 (0%)	0	100	100
1	C	196/231 (85%)	195 (100%)	1 (0%)	0	100	100
1	D	201/231 (87%)	200 (100%)	1 (0%)	0	100	100

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	E	197/231 (85%)	196 (100%)	1 (0%)	0	100	100
1	F	196/231 (85%)	195 (100%)	1 (0%)	0	100	100
1	G	194/231 (84%)	192 (99%)	2 (1%)	0	100	100
1	H	191/231 (83%)	190 (100%)	1 (0%)	0	100	100
1	I	193/231 (84%)	191 (99%)	2 (1%)	0	100	100
1	J	197/231 (85%)	195 (99%)	2 (1%)	0	100	100
1	K	195/231 (84%)	193 (99%)	2 (1%)	0	100	100
1	L	192/231 (83%)	191 (100%)	1 (0%)	0	100	100
All	All	2348/2772 (85%)	2332 (99%)	16 (1%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains ⓘ

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	166/193 (86%)	164 (99%)	2 (1%)	67	86
1	B	168/193 (87%)	165 (98%)	3 (2%)	54	80
1	C	168/193 (87%)	166 (99%)	2 (1%)	67	86
1	D	170/193 (88%)	167 (98%)	3 (2%)	54	80
1	E	168/193 (87%)	163 (97%)	5 (3%)	36	65
1	F	168/193 (87%)	165 (98%)	3 (2%)	54	80
1	G	166/193 (86%)	164 (99%)	2 (1%)	67	86
1	H	167/193 (86%)	163 (98%)	4 (2%)	44	73
1	I	164/193 (85%)	161 (98%)	3 (2%)	54	80
1	J	168/193 (87%)	165 (98%)	3 (2%)	54	80
1	K	170/193 (88%)	165 (97%)	5 (3%)	37	67
1	L	165/193 (86%)	162 (98%)	3 (2%)	54	80
All	All	2008/2316 (87%)	1970 (98%)	38 (2%)	52	79

5 of 38 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	D	148	THR
1	F	63	GLN
1	D	187	GLU
1	E	148	THR
1	F	148	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 14 such sidechains are listed below:

Mol	Chain	Res	Type
1	D	67	GLN
1	E	63	GLN
1	F	176	GLN
1	E	183	ASN
1	F	67	GLN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

12 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	J6U	F	301	-	63,63,63	1.86	4 (6%)	88,93,93	2.36	12 (13%)
2	J6U	H	301	-	63,63,63	2.15	2 (3%)	88,93,93	2.10	12 (13%)
2	J6U	C	301	-	63,63,63	2.08	3 (4%)	88,93,93	2.26	13 (14%)
2	J6U	D	301	-	63,63,63	1.99	2 (3%)	88,93,93	1.78	9 (10%)
2	J6U	L	301	-	63,63,63	2.15	3 (4%)	88,93,93	1.89	10 (11%)
2	J6U	K	301	-	63,63,63	2.38	2 (3%)	88,93,93	1.99	11 (12%)
2	J6U	I	301	-	63,63,63	2.18	2 (3%)	88,93,93	2.64	11 (12%)
2	J6U	A	301	-	63,63,63	2.21	2 (3%)	88,93,93	1.86	15 (17%)
2	J6U	E	301	-	63,63,63	2.06	2 (3%)	88,93,93	1.54	6 (6%)
2	J6U	G	301	-	63,63,63	2.45	3 (4%)	88,93,93	2.17	13 (14%)
2	J6U	J	301	-	63,63,63	2.43	2 (3%)	88,93,93	2.21	13 (14%)
2	J6U	B	301	-	63,63,63	1.99	2 (3%)	88,93,93	1.79	10 (11%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	J6U	F	301	-	-	4/40/65/65	0/7/7/7
2	J6U	H	301	-	-	12/40/65/65	0/6/7/7
2	J6U	C	301	-	-	4/40/65/65	0/7/7/7
2	J6U	D	301	-	-	3/40/65/65	0/7/7/7
2	J6U	L	301	-	-	7/40/65/65	0/6/7/7
2	J6U	K	301	-	-	7/40/65/65	0/7/7/7
2	J6U	I	301	-	-	13/40/65/65	0/7/7/7
2	J6U	A	301	-	-	4/40/65/65	0/7/7/7
2	J6U	E	301	-	-	4/40/65/65	0/7/7/7
2	J6U	G	301	-	-	12/40/65/65	0/6/7/7
2	J6U	J	301	-	-	16/40/65/65	0/6/7/7
2	J6U	B	301	-	-	3/40/65/65	0/7/7/7

The worst 5 of 29 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	G	301	J6U	O8-S2	14.27	1.58	1.43
2	K	301	J6U	O6-S2	13.49	1.57	1.43

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	E	301	J6U	O6-S2	13.17	1.57	1.43
2	J	301	J6U	O8-S2	13.16	1.57	1.43
2	A	301	J6U	O6-S2	13.14	1.57	1.43

The worst 5 of 135 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	I	301	J6U	O8-S2-N7	13.96	119.83	106.69
2	C	301	J6U	O8-S2-N7	11.96	117.95	106.69
2	F	301	J6U	O6-S2-N7	10.46	116.54	106.69
2	F	301	J6U	O8-S2-O6	-10.16	103.73	119.59
2	G	301	J6U	O8-S2-N7	9.99	116.09	106.69

There are no chirality outliers.

5 of 89 torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	G	301	J6U	C10-N2-S1-C5
2	J	301	J6U	C10-N2-S1-C5
2	G	301	J6U	C7-N2-S1-O2
2	G	301	J6U	C7-N2-S1-O1
2	H	301	J6U	C7-N2-S1-O2

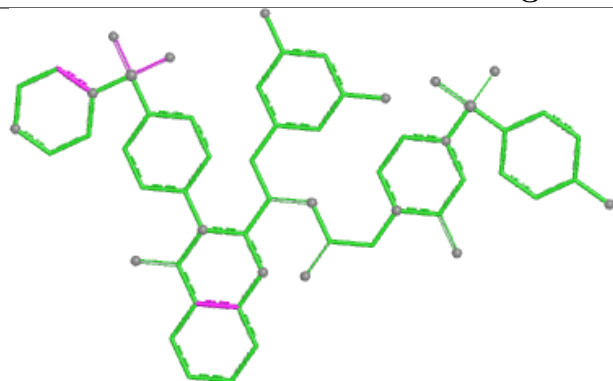
There are no ring outliers.

2 monomers are involved in 3 short contacts:

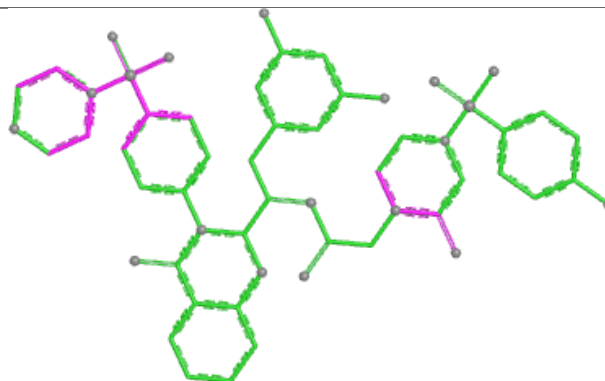
Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	C	301	J6U	2	0
2	K	301	J6U	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.

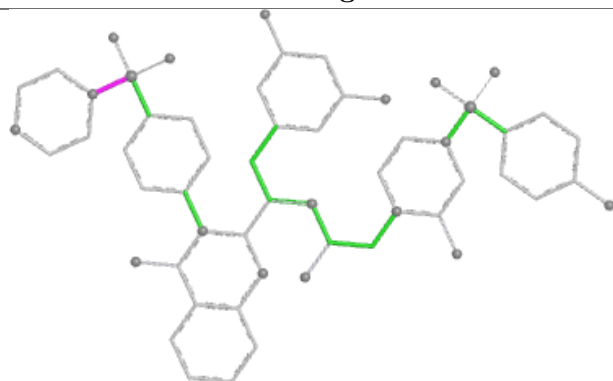
Ligand J6U F 301



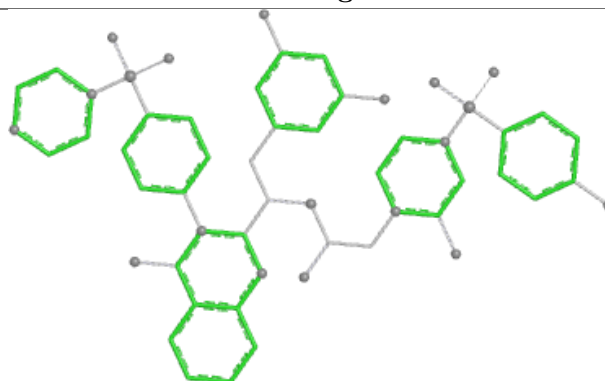
Bond lengths



Bond angles

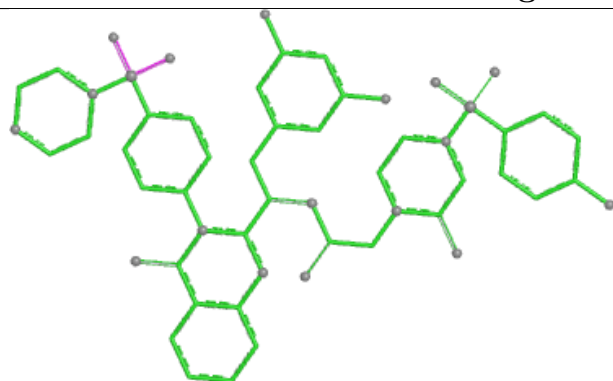


Torsions

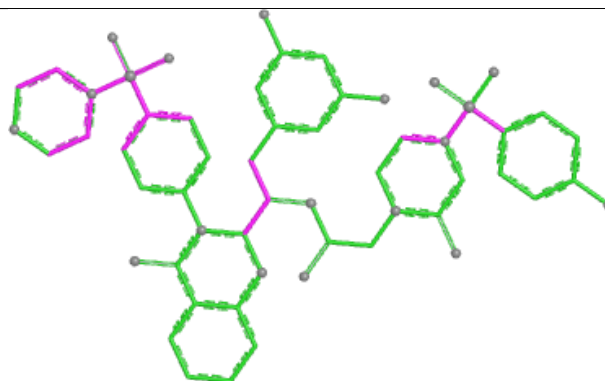


Rings

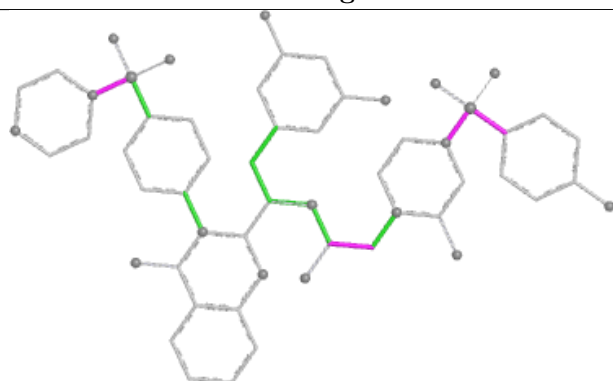
Ligand J6U H 301



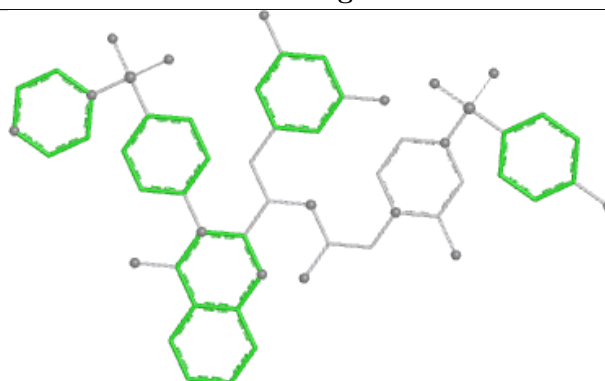
Bond lengths



Bond angles

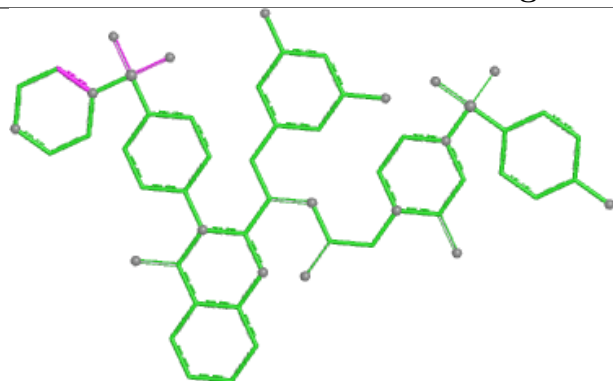


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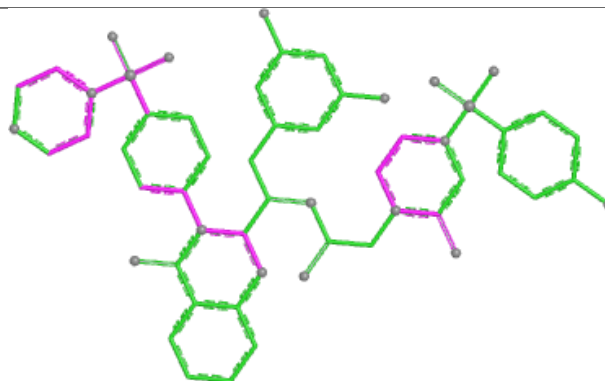


Rings

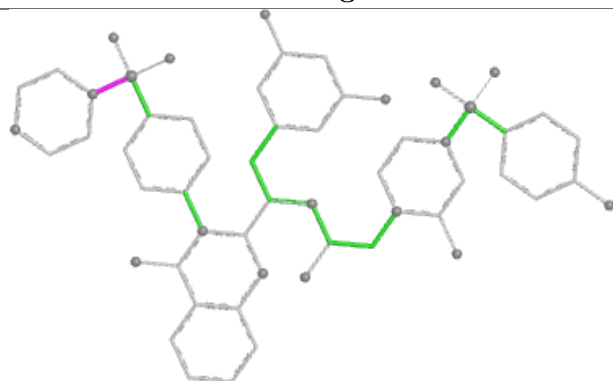
Ligand J6U C 301



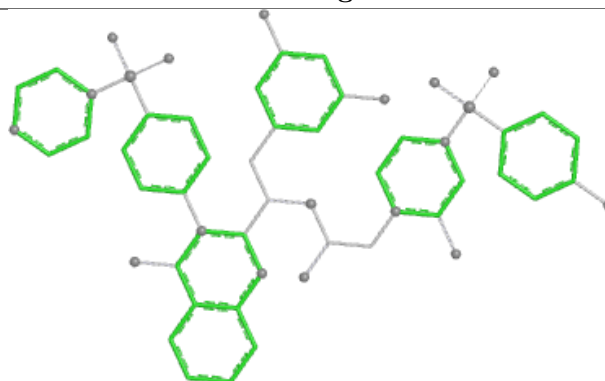
Bond lengths



Bond angles

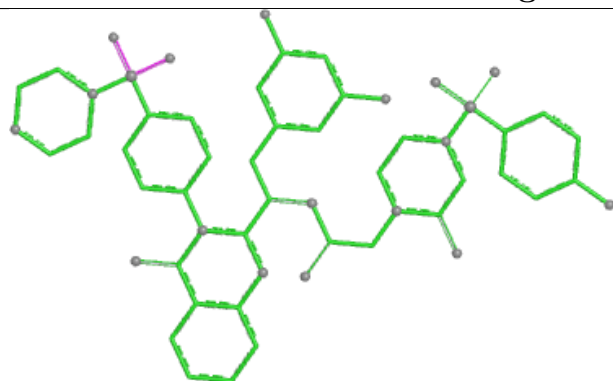


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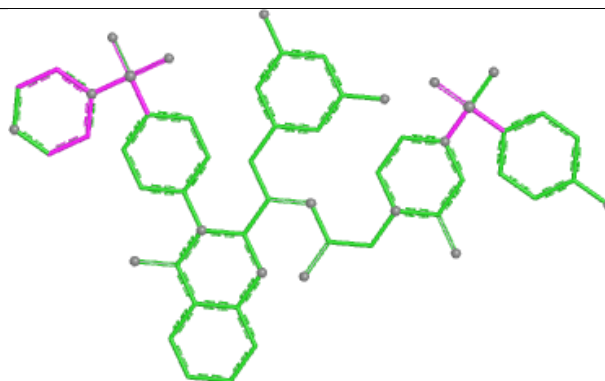


Rings

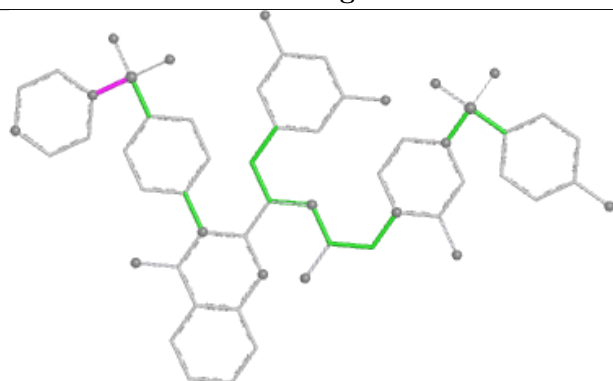
Ligand J6U D 301



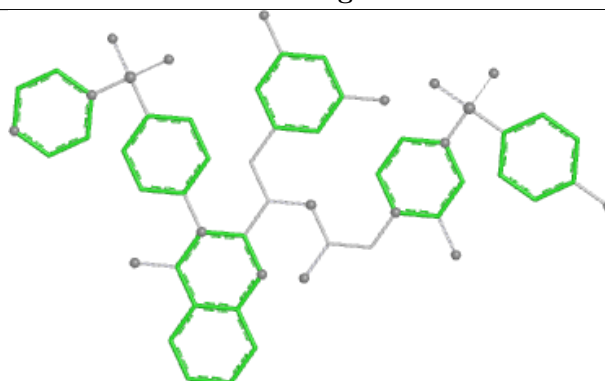
Bond lengths



Bond angles

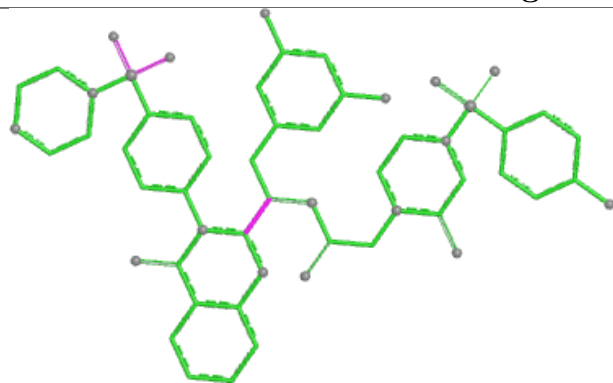


Torsions

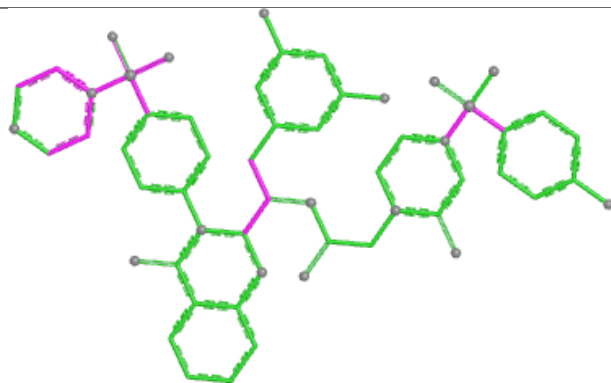


Rings

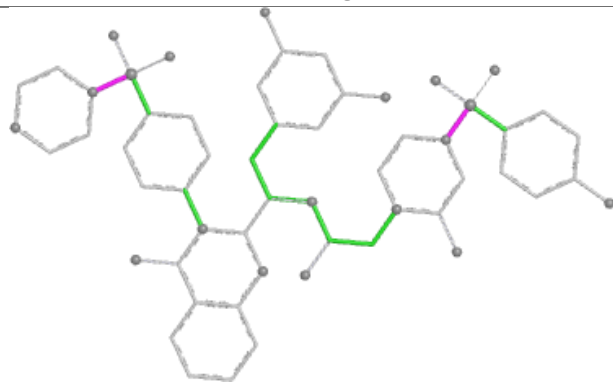
Ligand J6U L 301



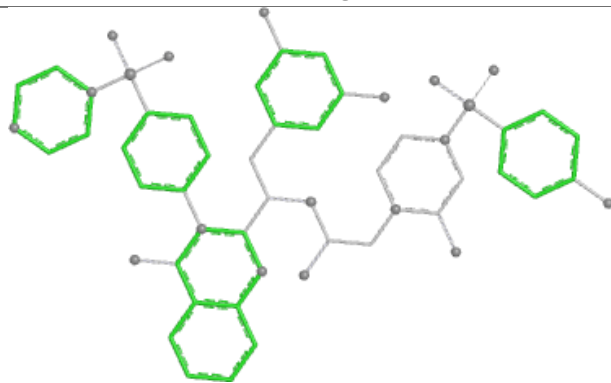
Bond lengths



Bond angles

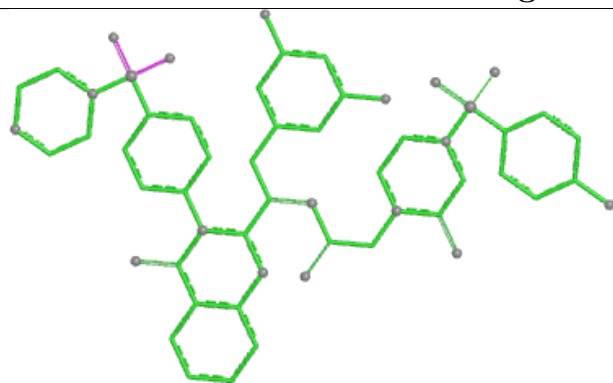


Torsions

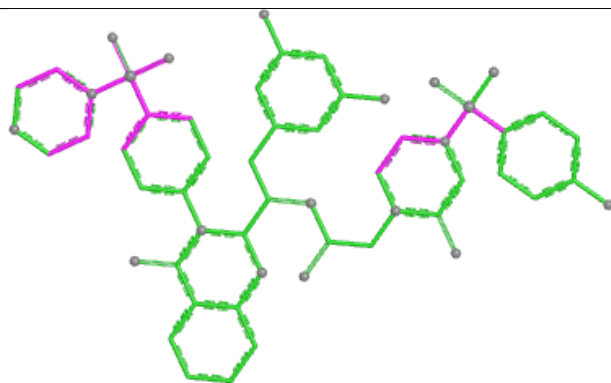


Rings

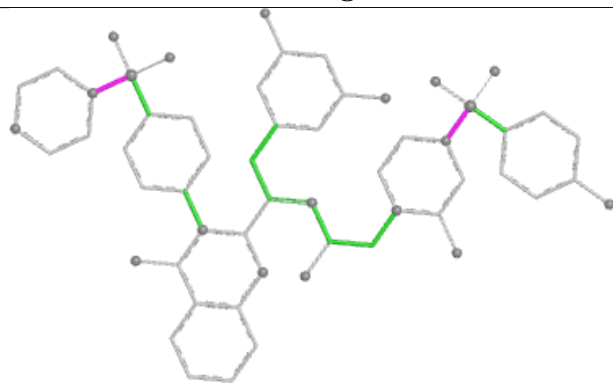
Ligand J6U K 301



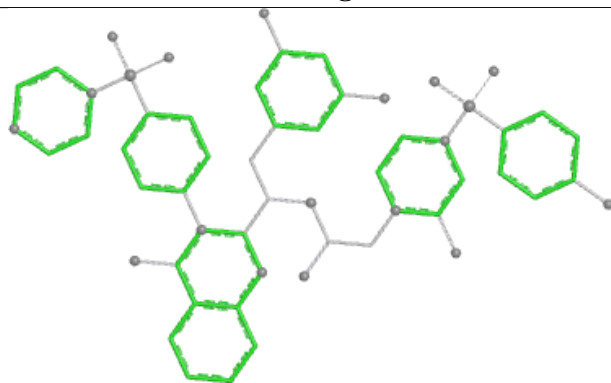
Bond lengths



Bond angles

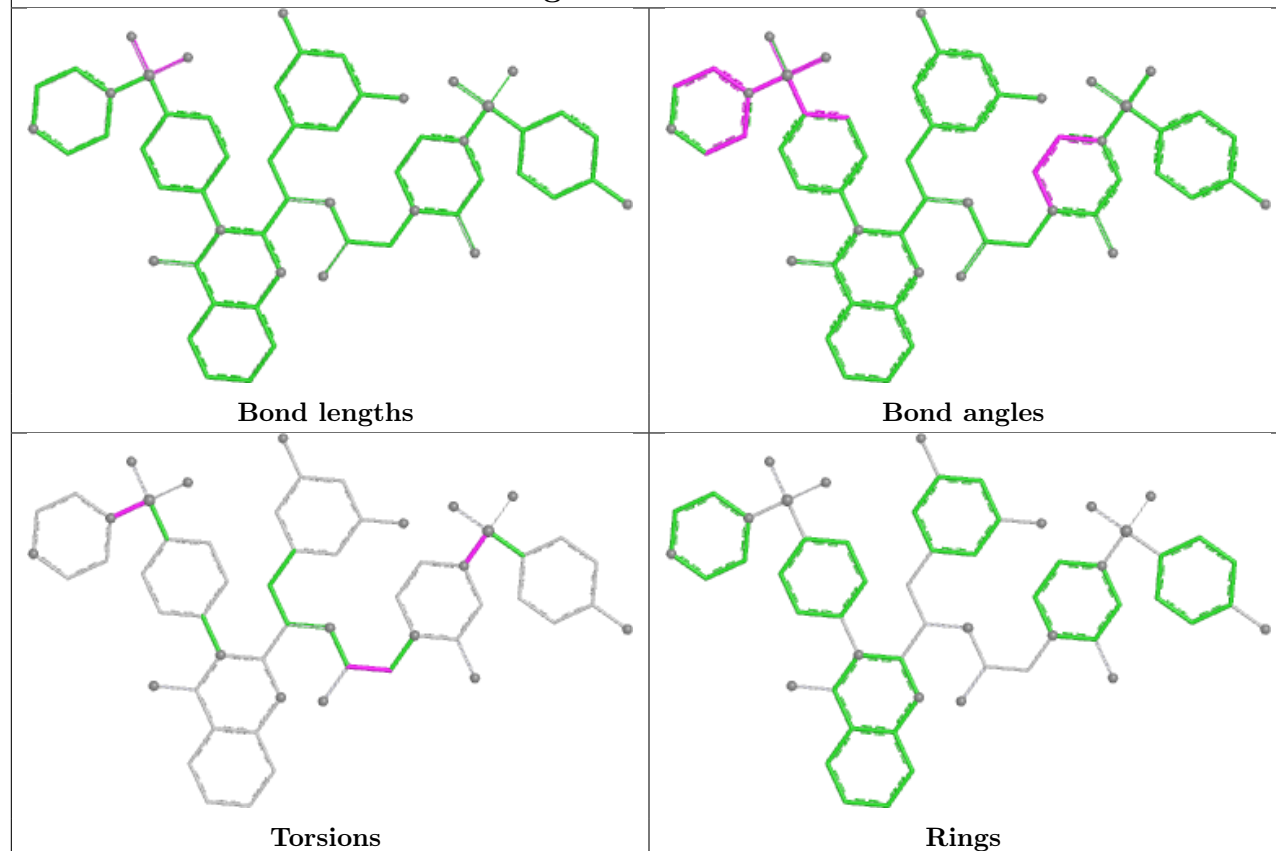


Torsions

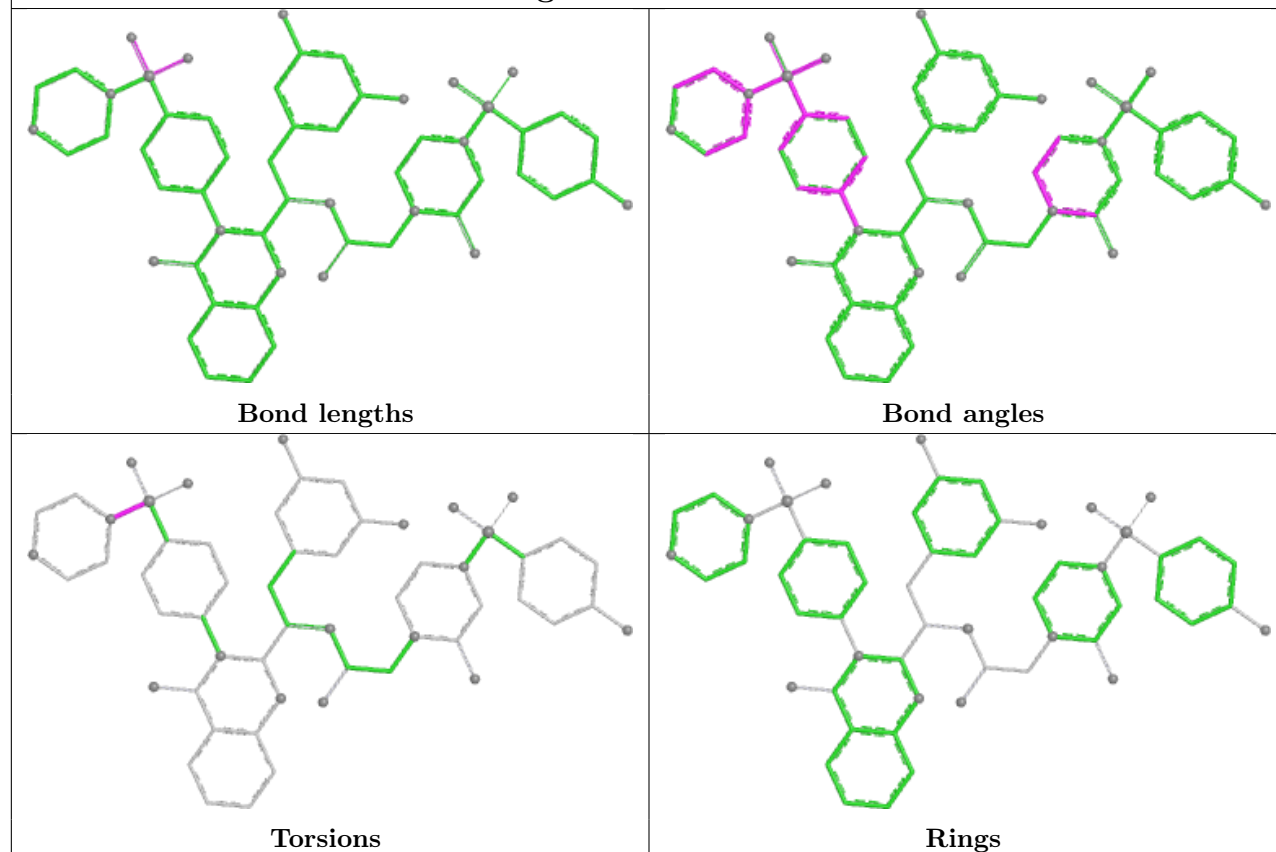


Rings

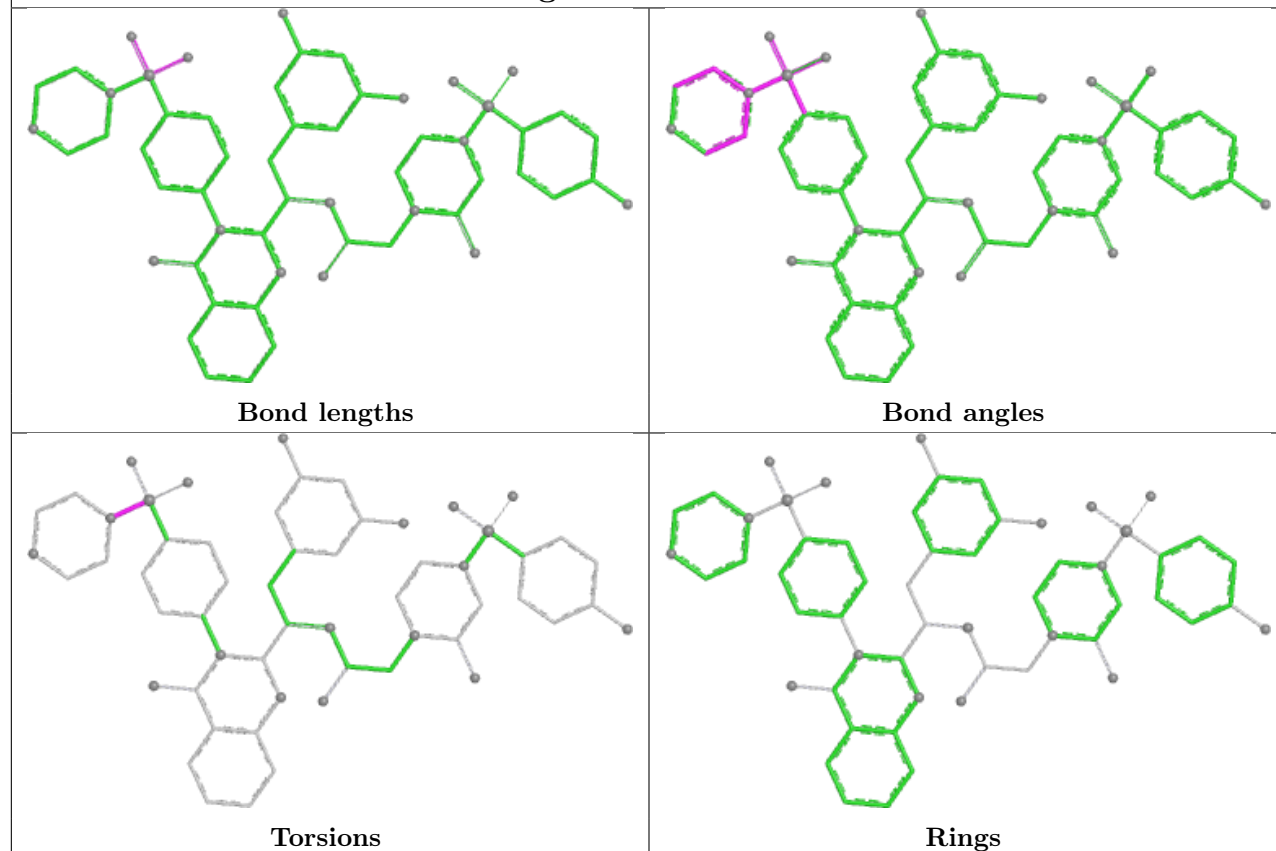
Ligand J6U I 301



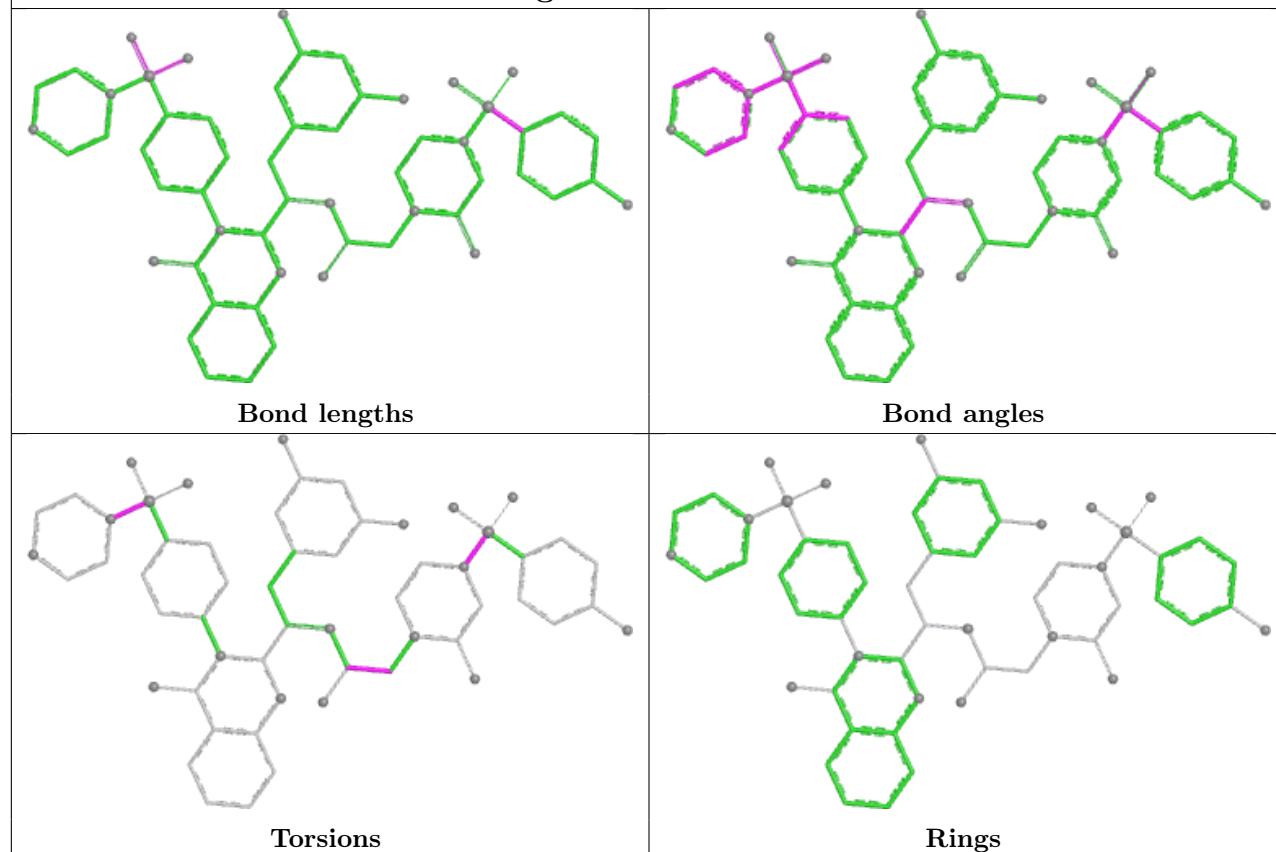
Ligand J6U A 301



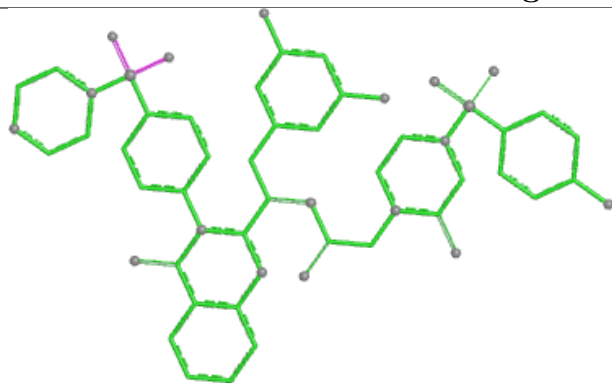
Ligand J6U E 301



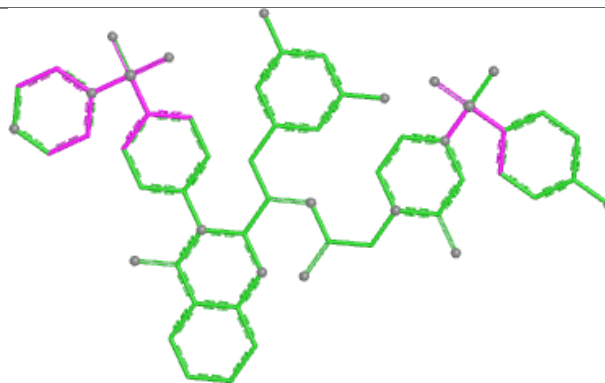
Ligand J6U G 301



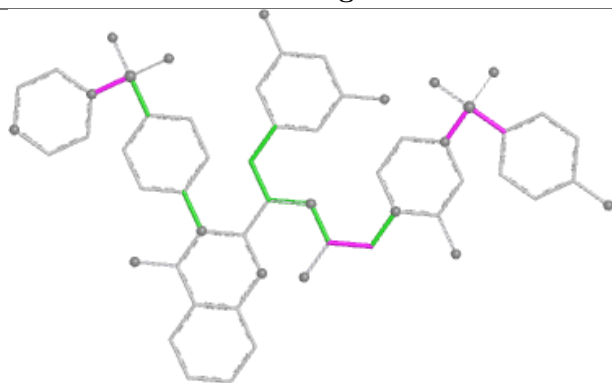
Ligand J6U J 301



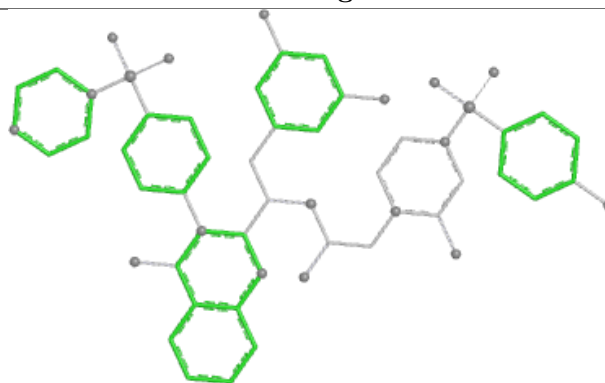
Bond lengths



Bond angles

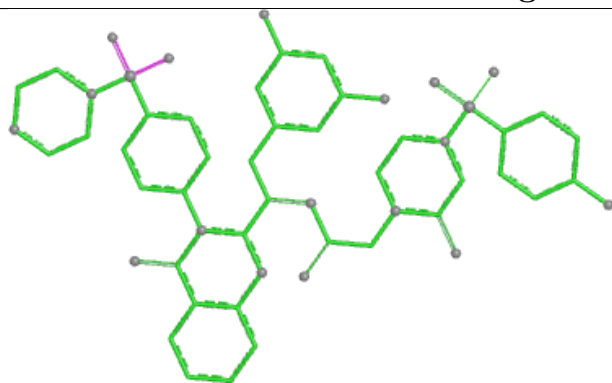


Torsions

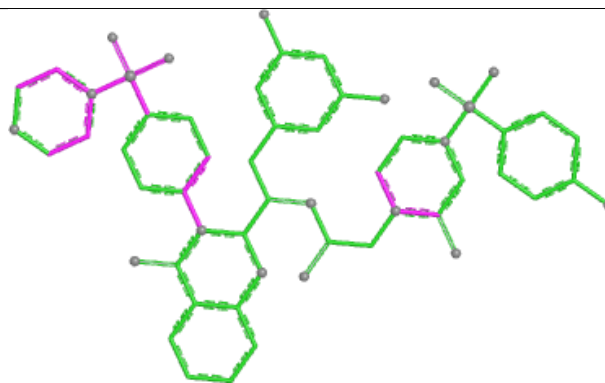


Rings

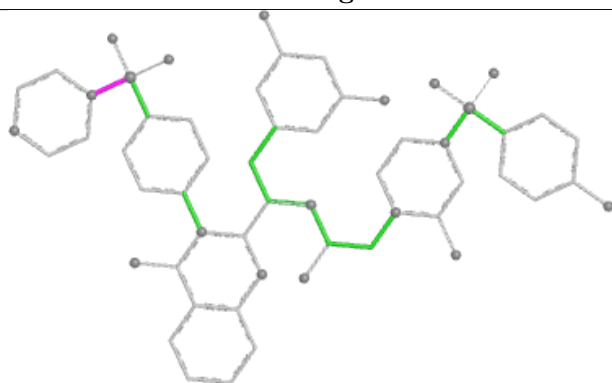
Ligand J6U B 301



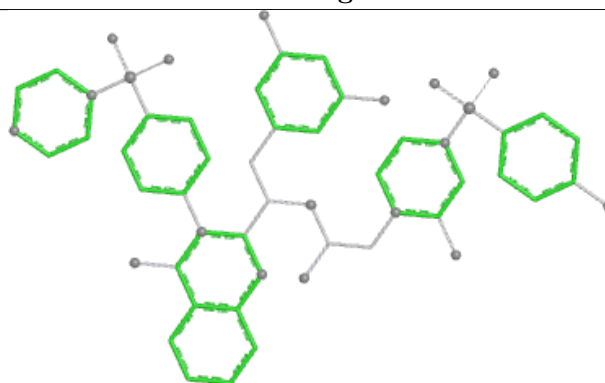
Bond lengths



Bond angles



Torsions



Rings

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.

6 Fit of model and data ⓘ

6.1 Protein, DNA and RNA chains ⓘ

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ > 2			OWAB(Å ²)	Q < 0.9
1	A	202/231 (87%)	-0.06	6 (2%)	52	50	24, 46, 84, 108	0
1	B	207/231 (89%)	-0.18	6 (2%)	54	52	25, 42, 77, 108	1 (0%)
1	C	203/231 (87%)	-0.07	5 (2%)	58	57	25, 44, 84, 118	1 (0%)
1	D	206/231 (89%)	-0.03	6 (2%)	54	52	26, 46, 91, 127	1 (0%)
1	E	202/231 (87%)	-0.14	6 (2%)	52	50	24, 42, 74, 113	1 (0%)
1	F	202/231 (87%)	-0.12	4 (1%)	64	64	25, 45, 85, 107	0
1	G	202/231 (87%)	-0.24	5 (2%)	58	57	21, 38, 76, 102	0
1	H	199/231 (86%)	-0.28	5 (2%)	58	57	18, 37, 72, 88	0
1	I	200/231 (86%)	-0.27	2 (1%)	79	79	19, 40, 77, 100	1 (0%)
1	J	204/231 (88%)	-0.20	3 (1%)	71	71	21, 42, 81, 98	1 (0%)
1	K	202/231 (87%)	-0.21	4 (1%)	64	64	18, 39, 74, 91	1 (0%)
1	L	199/231 (86%)	-0.20	4 (2%)	64	64	18, 38, 80, 98	1 (0%)
All	All	2428/2772 (87%)	-0.17	56 (2%)	61	60	18, 42, 81, 127	8 (0%)

The worst 5 of 56 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	E	3	VAL	4.6
1	G	3	VAL	4.4
1	A	3	VAL	4.2
1	K	145	TYR	3.6
1	B	96	MET	3.4

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

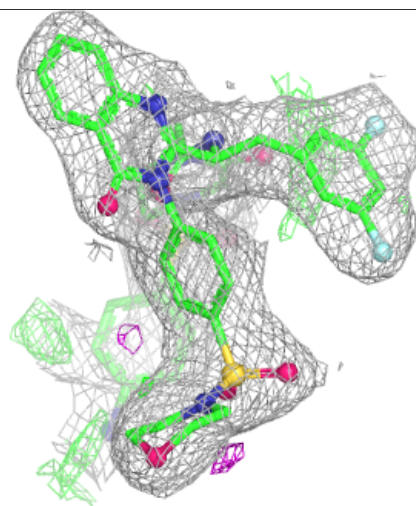
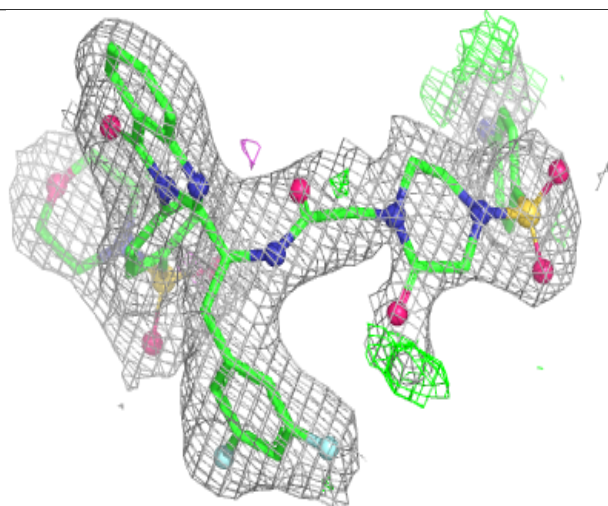
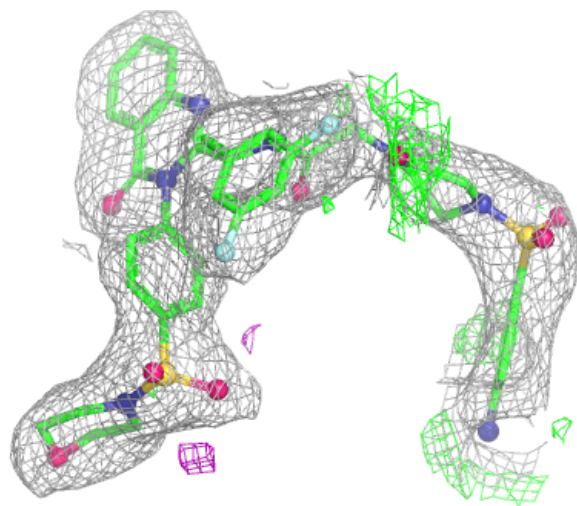
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	J6U	G	301	57/57	0.91	0.11	28,39,109,117	0
2	J6U	I	301	57/57	0.93	0.10	25,33,105,107	0
2	J6U	J	301	57/57	0.94	0.09	24,35,100,122	0
2	J6U	L	301	57/57	0.94	0.09	24,34,94,99	0
2	J6U	H	301	57/57	0.94	0.10	22,34,108,125	0
2	J6U	K	301	57/57	0.95	0.09	27,33,96,100	0
2	J6U	C	301	57/57	0.95	0.07	30,38,49,55	0
2	J6U	D	301	57/57	0.95	0.08	27,39,53,55	0
2	J6U	F	301	57/57	0.95	0.08	28,36,57,61	0
2	J6U	B	301	57/57	0.96	0.07	23,35,53,54	0
2	J6U	E	301	57/57	0.96	0.07	26,35,47,52	0
2	J6U	A	301	57/57	0.96	0.07	27,40,52,54	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

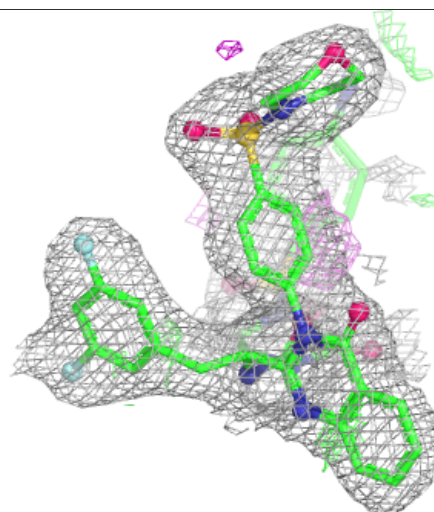
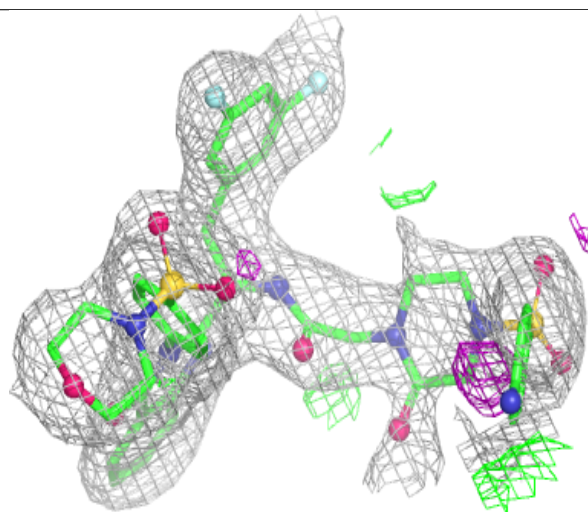
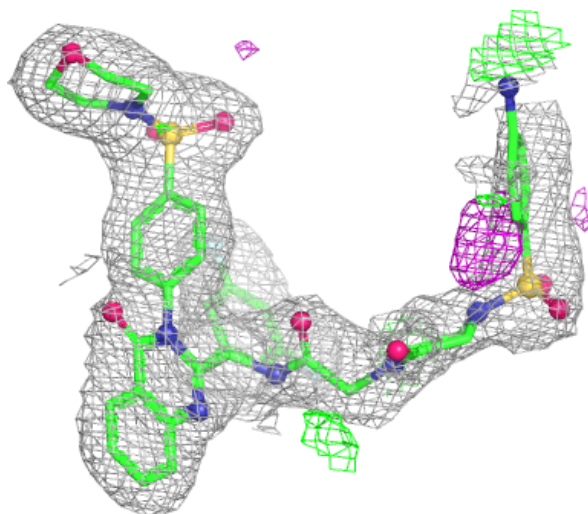
Electron density around J6U G 301:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



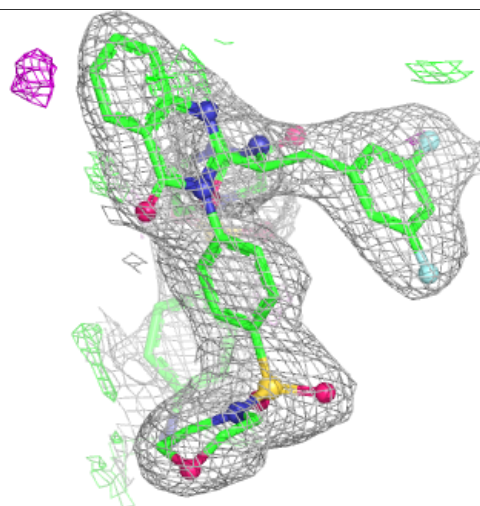
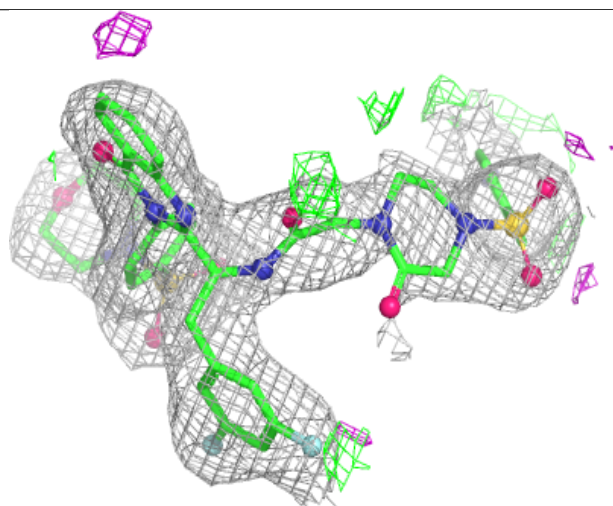
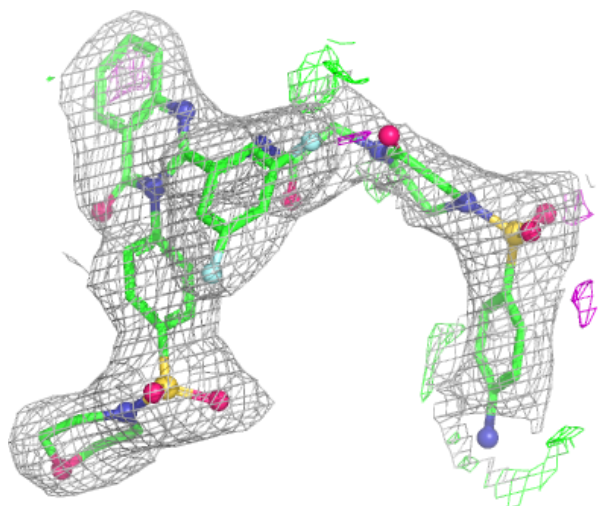
Electron density around J6U I 301:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



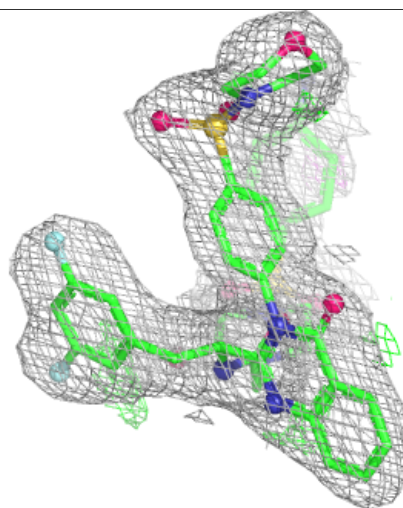
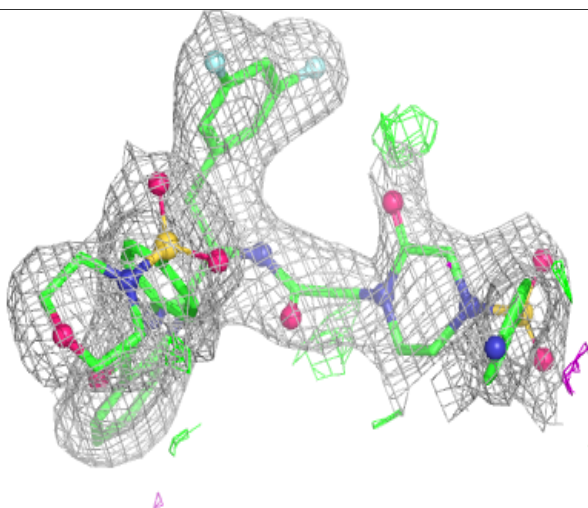
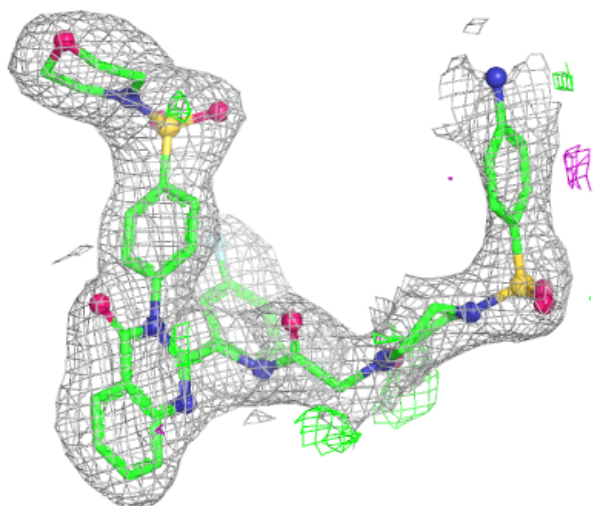
Electron density around J6U J 301:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



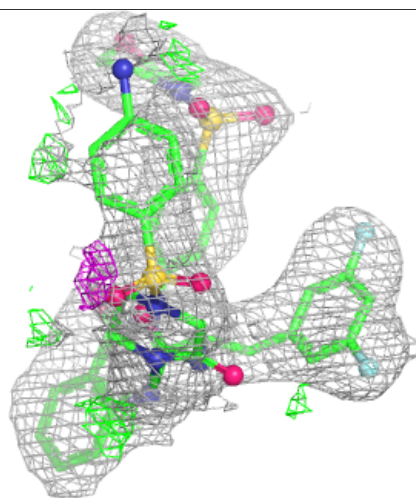
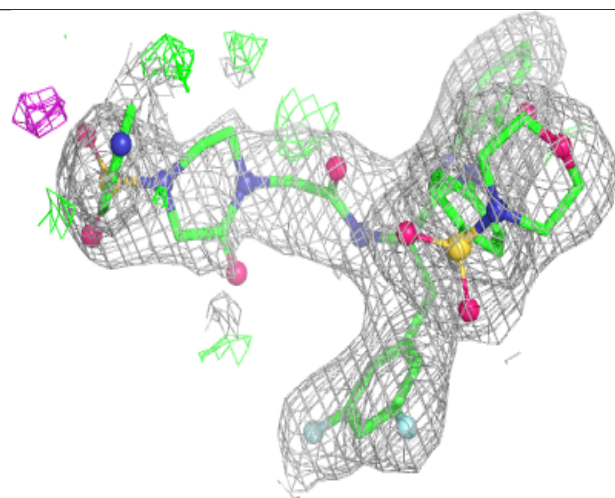
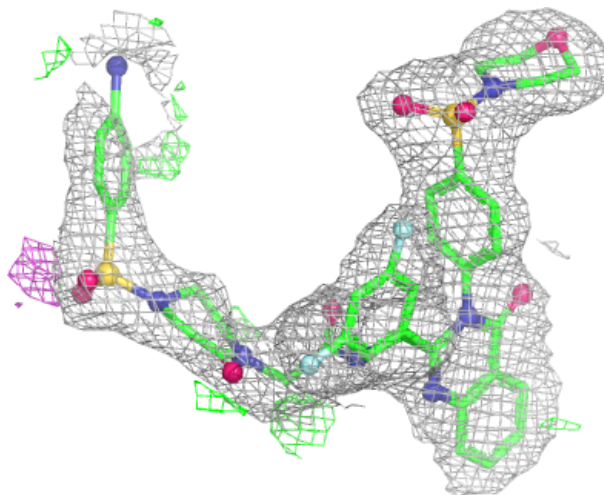
Electron density around J6U L 301:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



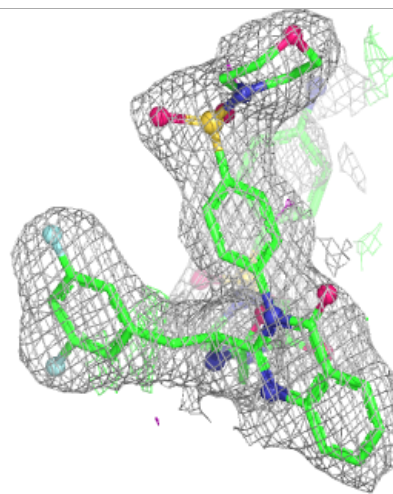
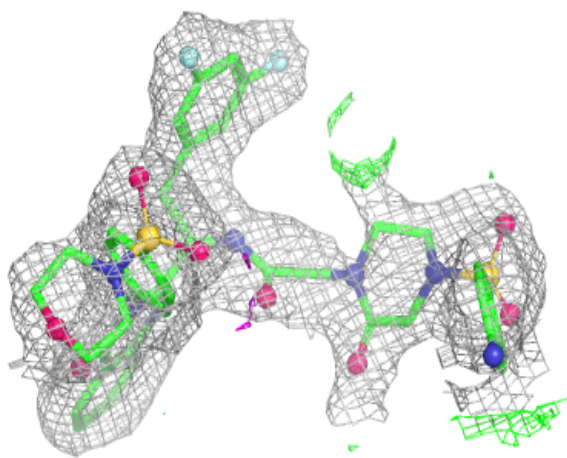
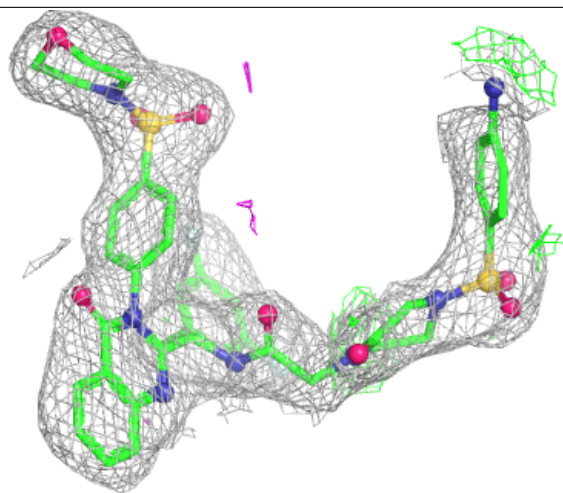
Electron density around J6U H 301:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



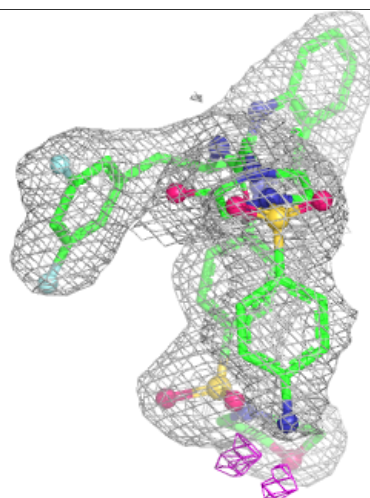
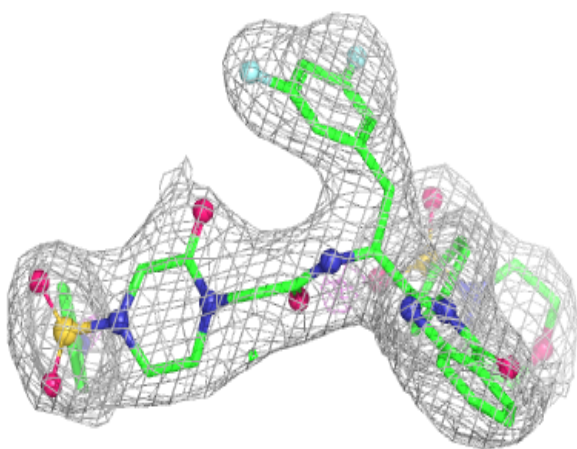
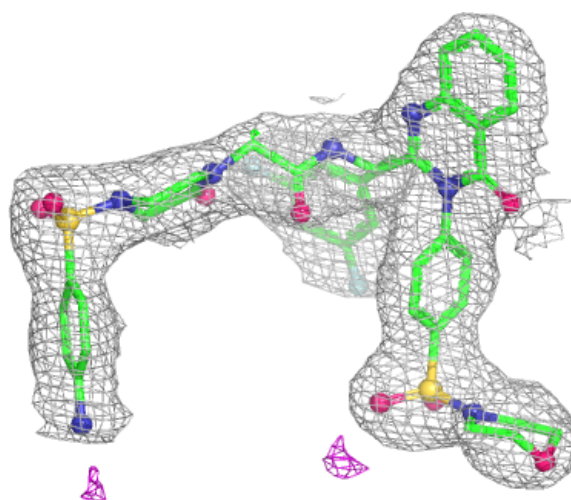
Electron density around J6U K 301:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



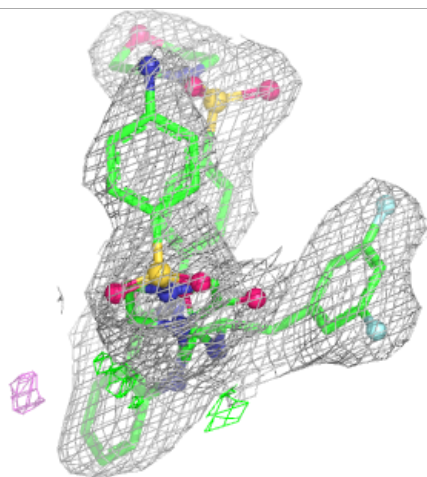
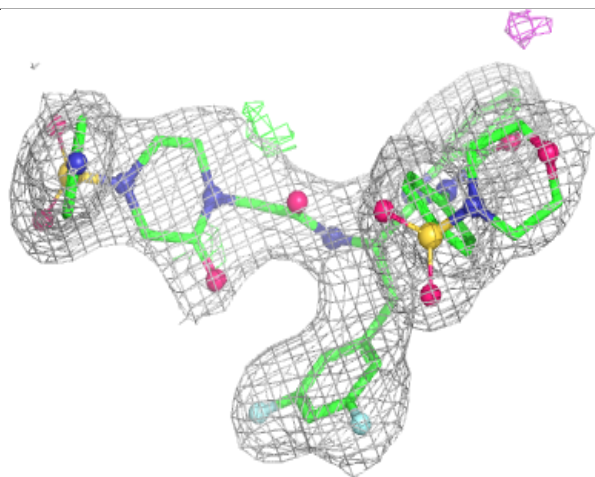
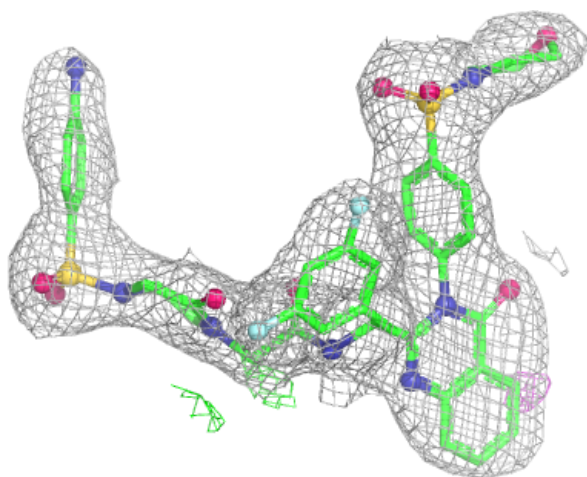
Electron density around J6U C 301:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



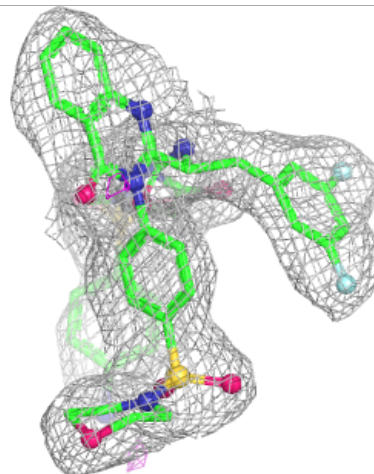
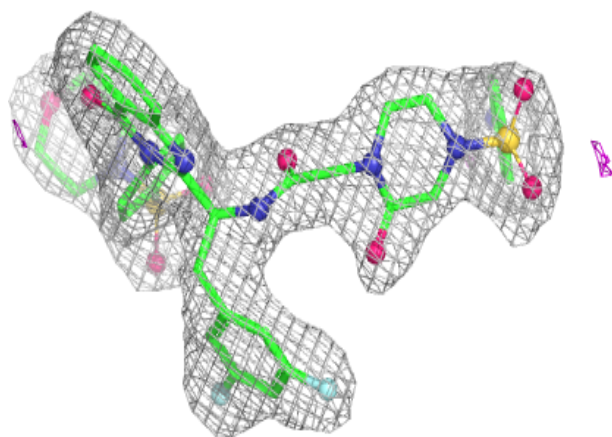
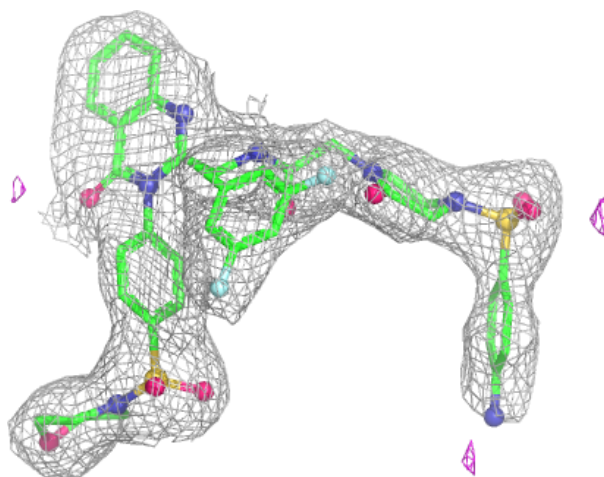
Electron density around J6U D 301:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



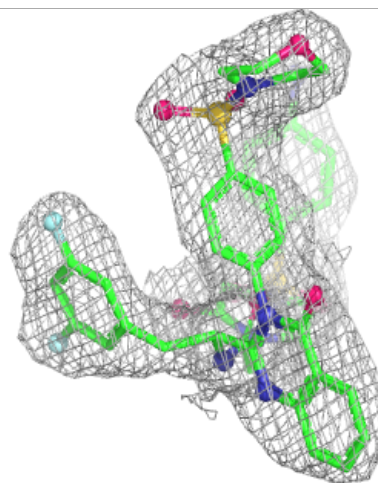
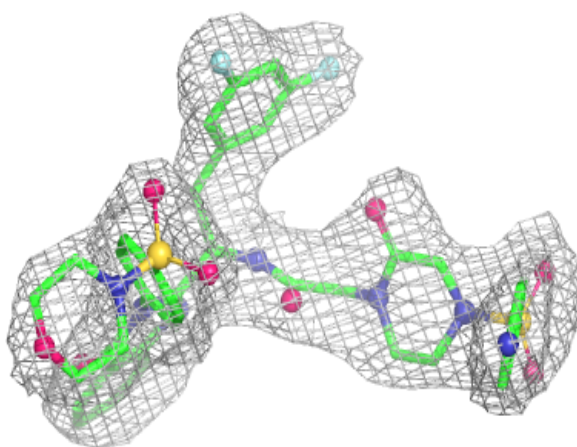
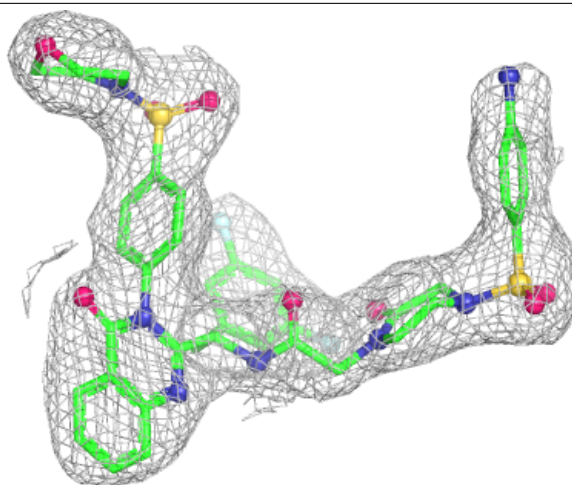
Electron density around J6U F 301:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



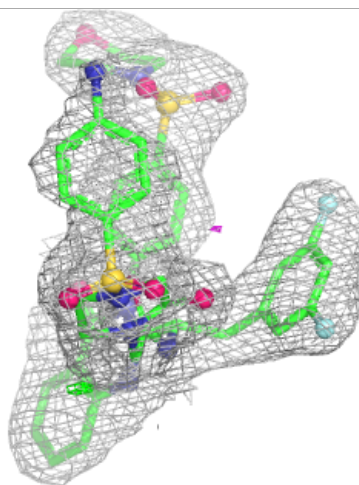
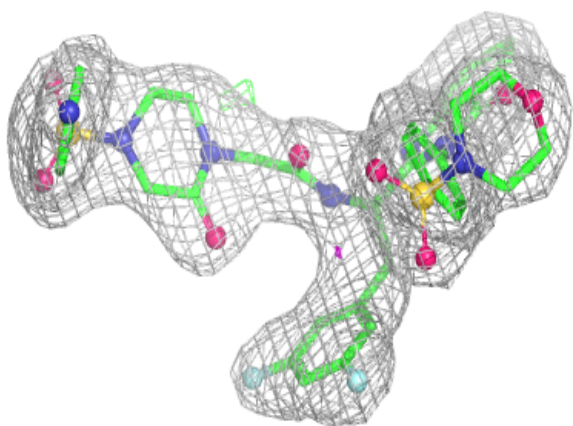
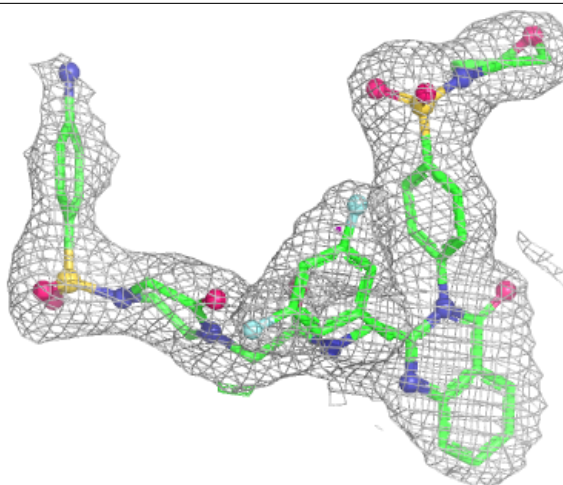
Electron density around J6U B 301:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



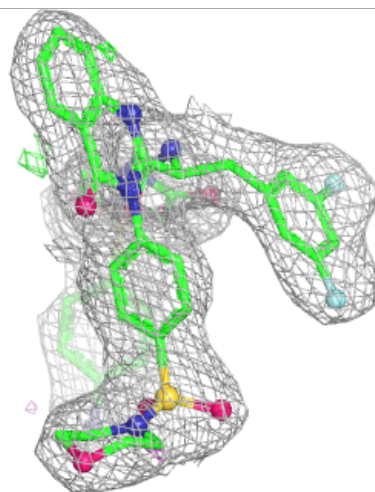
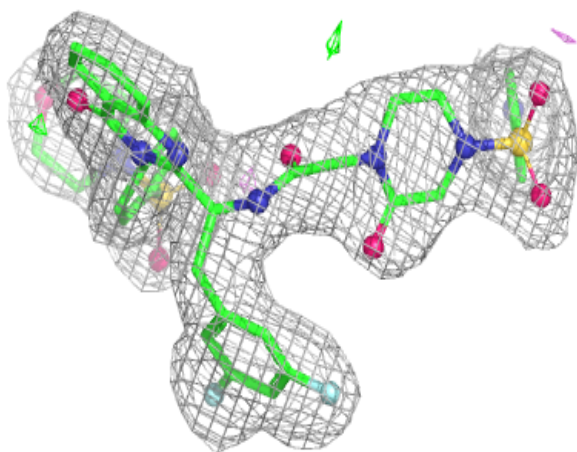
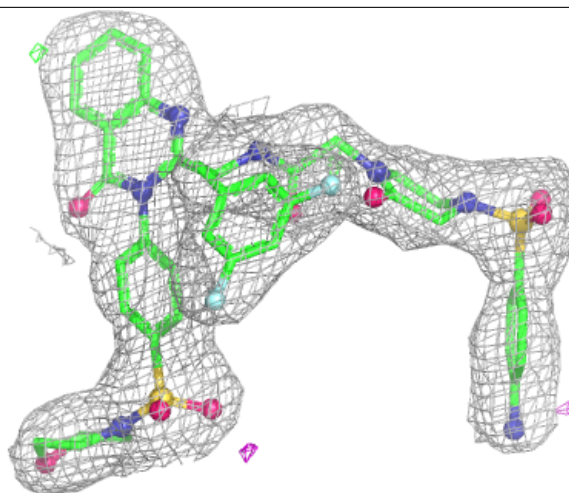
Electron density around J6U E 301:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around J6U A 301:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



6.5 Other polymers [i](#)

There are no such residues in this entry.